Claims

1. A method for operating a line-supplied charger (100) for a battery (200) in a charge-receiving mode for keeping the battery in a charged state, in which the battery (200) alternates cyclically between a resting phase (R) and a refreshing phase (A),

in which the battery (200), in the resting phase (R), discharges from an upper threshold voltage (U_{OG}) to a lower threshold voltage (U_{UG}) which is lower than the upper threshold voltage but is preferably higher than the rated voltage of the battery; and

in which the battery (200), in the refreshing phase (A), is charged again from the lower to the upper threshold voltage via a charge transformer (120) of the charger (100);

characterized in that at least individual components, in particular the charge transformer (120) of the charger (100), are switched off from the line voltage (U_N) during the resting phase (R).

2. The method according to claim 1, characterized in that in the charge-receiving mode, the alternation from the resting phase (R) to the refreshing phase (A) takes place whenever the battery voltage (U_B) has reached or undershot the lower threshold voltage (U_{UG}).

3. The method according to one of the foregoing claims, characterized in that the battery (200) is charged with a predefined constant charging current (I_L) during the refreshing phase (A).

4. The method according to one of the foregoing claims, characterized in that in the charge-receiving mode, the alternation from the refreshing phase (A) to the resting phase (R) is effected whenever the battery (200) has been charged to the upper threshold voltage or above it.

5. The method according to one of the foregoing claims, characterized in that the charge-receiving mode is preceded by a charging mode (AL), in which the battery (200), in a first phase, is charged preferably with a constant current to the upper threshold voltage (U_{OG}) and, in a second phase, is supplied with a constant charging voltage.

6. The method according to claim 5, characterized in that an alternation from the second phase of the charging mode to the charge-receiving mode, in particular to the resting phase (R), takes place when the upper threshold voltage (U_{OG}) has been maintained with the aid of the constant charging voltage, and simultaneously the charging current has dropped to a predetermined value that is less than the value of the constant current in the first phase.

7. A computer program having a program code for a battery charger, characterized in that the program code is embodied for performing the method according to one of claims 1 through 6.

8. A data medium having a computer program according to claim 7.

9. A charger (100) for charging a battery (200) from a line voltage (U_N), including:

- a charge transformer (120) for transforming the primary line voltage (U_N) into a secondary voltage;

- a rectifier (130), which is connected downstream of the charge transformer (120) on its secondary side, for furnishing a charging voltage (U_B) for the battery from the secondary voltage; and

- a control unit (150) for triggering the rectifier (130) via a control signal (S1) in response to the charging voltage (U_B), in particular in such a way that the battery (200), after its charging phase, is kept in its charged state in that the battery (200) alternates cyclically between a resting phase (R), in which the battery discharges from an upper threshold voltage (U_{OG}) to a lower threshold voltage (U_{UG}) which is lower than the upper threshold voltage but preferably greater than the line voltage of the battery, and a refreshing phase (A), in which the battery (200) is charged again from the lower to the upper threshold voltage via the charge transformer (120) of the charger (100);

characterized by a first comparator (160) for generating a first comparison signal (V1), when the battery voltage (U_B) at the end of the refreshing phase has reached or exceeded the upper threshold voltage (U_{OG}); and

a switching device (110) for switching off at least the charge transformer (120), during the resting phase (R), from the line voltage (U_N) in response to a switching signal (S2), which represents the first comparison signal (V1).

10. The charger (100) according to claim 9, characterized by a second comparator (170) for generating a second comparison signal (V2), when the battery voltage (U_B)

at the end of the resting phase (R) has reached or undershot the lower threshold voltage (U_{UG}).

11. The charger (100) according to claim 10, characterized by an OR logic module (180) for furnishing the switching signal (S2) for the switching device (110) as an OR linkage from the first and the second comparison signals (V1, V2).

12. The charger according to claim 11, characterized in that the two comparison signals (V1, V2) are synchronized with one another in such a way that upon generation of the first comparison signal (V1), the second comparison signal (V2) is also converted to a state such that the switching signal (S2) at the output of the OR logic module (180) assumes a state which switches off the switching device (110).

13. The charger (100) according to one of claims 9 through 12, characterized by a supply transformer (140) for supplying the control unit (150), on its secondary side, with a supply voltage.

14. The charger according to claim 13, characterized in that the supply transformer (140) is connected downstream of the switching device (110) and with its primary side is connected parallel to the charge transformer (120).

15. The charger according to claim 13, characterized in that the supply transformer (140) is connected upstream of the switching device (110) and is coupled with its primary side to the line voltage (U_N).

16. The charger (100) according to one of claims 9

through 15, characterized in that the control unit, the first and second comparators (160, 170), and/or the OR logic module (180) are realized as an integrated circuit, preferably as a microcontroller or microprocessor with a suitable computer program.

17. The charger (100) according to one of claims 9 through 15, characterized in that the comparators (160, 170) are embodied by analog hardware.

18. The charger (100) according to one of claims 9 through 16, characterized in that the switching device (110) is embodied as an opto-triac.